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A CAHNERS PUBLICATION

INTERNATIONAL EDITION/166 TOTAL PAGES

DATAMATION

FOR MANAGERS OF INFORMATION TECHNOLOGY WORLDWIDE

NOVEMBER 1, 1990

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Compaq, Senior Vice President,
Systems Engineering

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VOLUME 36
NUMBER 21

Compaq's Stimac operates in minicomputer and mainframe territory.

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SystemPRO Revs Up Networks 30

BY BOB FRANCIS Compaq applies big-system hardware concepts to a local area network server that aces network-busting jobs. But full performance depends on other factors: software and systems implementation.

Cover photography by Janice Ruben

SPECIAL REPORT

SALARY SURVEY

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BY ANGELINE PANTAGES

It could be hard times for many IS staffers, whose raises may not keep up with inflation this year. But for those with the right talents, the jobs are open and the money is still flowing.

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IBM's Zeitler serves AS/400 power at lower prices.

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BY JEFF MOAD When disaster downs your data center, it bruises your business. New technologies such as electronic vaulting, remote journaling and database shadowing could get your company up and running in a hurry.

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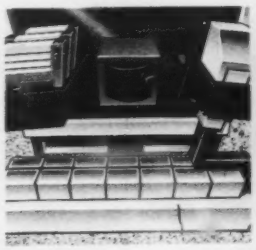

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Salaries Rise 5.6% In Soft Market

It could be hard times for many IS staffers, whose raises may not keep up with inflation this year. But for those with the right talents, the jobs are open and the money is still flowing.

BY ANGELINE PANTAGES

Salaries for chief information officers (CIOs) are in the six figures. Data and information network architects are being hired at $90,000-plus. Personal computer local area network experts, knowledge engineers and computer-aided software engineering (CASE) gurus are going at a premium. Triple threats with expertise in engineering, manufacturing and programming are in demand. There are job openings all around the country that are going begging.

Yet, the market for IS professionals nationwide has been dubbed soft by industry recruiters. Many companies that are downsizing aren't expanding their IS staffs. They're generally not giving big pay hikes to job-hoppers, and they're loath to pay the escalating costs of relocation. And, according to DATAMATION's new survey of salaries and trends among 166 responses, they may not be giving existing staff a big enough salary increase this year to cover the costs of inflation, which some economists expect to be 6%, or perhaps higher.

These are very mixed signals for IS professionals. But they have to listen carefully to what those signals are saying. There is some demand, but the job descriptions are highly specific and quite often require expertise in several technologies or in a combination of technology and business. Often, knowledge of an industry or of one or more business functions is required. Furthermore, companies are not too willing to settle for less. Either they won't fill them, or they'll contract the work out if they can.

Three factors are important in deciphering these mixed signals:

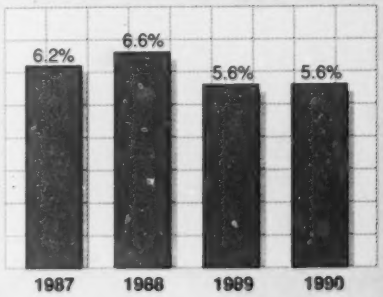
- The current employment down cycle in the market.
- The current skills needed—what's hot and what's not.
- The long-range technological and business needs of corporations racing to stay ahead of the pack or struggling to maintain competitive parity.

Steve Joffe, vice president of nationwide recruiter Source EDP, puts the current market softness into perspective. "What's going on now is a correction in the marketplace against the 'run run' of the '80s. It may last nine or 18 months, and then there will be another correction. I don't think there are many computer professionals who are unemployed, but they are doing jobs that are less mobile because of the softening in demand. Companies are not going for major expansions of computer staffs." For the first time in more than eight years, he says, this sluggishness extends broadly to *Fortune 500* companies and banking institutions.

DATAMATION's survey generally confirms his assertions. Overall, the responding firms said their "DP professional" work force will decline slightly in 1990 by 2.3%. The biggest cutbacks in this sample are among the troubled banks (a whopping 35%), DP services (13%) and industrial manufacturers (10%). Many small companies (with under $100 million in revenues) reported 15 to 25% cutbacks, while

Average Salary Increases Flat

Salary survey results show that pay hikes will equal last year's but are smaller than those handed out in 1988 and 1987.



Source: Datamation

It's time that information systems departments alter their salary structures.

the largest (with revenues over $3 billion) averaged a 2% decline. Regionally, respondents in the recession-plagued northeastern metropolitan areas—Boston, New York City and Philadelphia—plan to downsize by an average of 16 to 20%.

But the picture isn't all bleak. There are firms and regions that either are doing well or are beginning their ascent from the doldrums and have a pent-up demand for people. For instance, 7 to 9% staff increases on average are planned by respondents from the consumer manufacturing, distribution and transportation/utilities sectors. Government sites reported a 4% average hike. And outside the evidence of our sample, recruiters say that the health services sector is actively hiring.

Geographically, in the reviving Rust Belt, some Chicago and Detroit firms reported 20% increases, and there is healthy hiring going on in Houston, San Francisco and Washington, D.C. Source EDP's regional director for northern California, Dave Flansbaum, reports that San Francisco area companies that survived the "feeding frenzy of leveraged buyouts" four years ago, are now lean, profitable and looking for more IS people than the market can supply.

Is It Time To Change Jobs?

In such a volatile market, professionals have many concerns. What are their prospects in their current companies and locations? Will it pay to move, or should they sit tight? First, within their companies, according to the DATAMATION survey, the average increase in salaries is 5.6% in 1990, equal to last year's but less than the 6.6% increase of 1988 and the 6.2% rise of 1987. This generally holds true across industries and across the country, with the exception of banking and government sectors, which are giving less than 5%. Inflationary trends, fueled by the crisis in the Middle East, may result in the cost of living going up to 7% in 1990. The result: a net income loss.

So, when inflation and other economic factors are taken into account, the survey indicates that the average salaries of middle management and their staffs have not changed appreciably from last year. Flansbaum at Source EDP confirms this and adds a troubling note. "The salary levels for first-and second-line managers are pretty stagnant. But what's happening is that the technical people, who have been receiving increases, are compressing up against those management levels. Somewhere in the universe, it's etched in stone that managers must make more than people who report to them." The result is that some companies, because they can't make adjustments in salary administration, have been hiring consultants, paying them several times what an employee would cost. "This is false economy," Flansbaum says, adding that it's time that companies alter their salary structures.

The survey indicates a general cutback of 10% in part-time and contractual personnel, but Joffe insists: "You won't get that data from surveys, because a lot of these people are being brokered independently."

So, many in-house professionals are faced with a stagnant income and competition from well-paid consultants. It's also not clear whether they are always receiving the training to keep up with changing demands. Recruiters maintain that training programs generally have not been cut, but neither have they increased. Past DATAMATION surveys have indicated an average of about $3,000 spent on training per IS employee. That was true this year, but the average number of hours has declined somewhat from 65 hours in 1988 to 59 hours this year.

Hiring Practices

A buyer's job market has a variety of characteristics. Joffe and other Source EDP recruiters say that firms are typically paying less for the average new hire—a 10% raise compared with 20% in better times, lower bonuses and other incentives and less coverage, if any, of relocation costs.

Another characteristic of the buyer's market is the demand for individuals with highly specific skill sets. Joffe says that firms typically want an individual to fill 80 to 90% of the job profile so that they can avoid the costs of training and realize optimum productivity almost instantly.

John J. Davis, principal of executive search firm John J. Davis & Associates Inc. in New York City, says the chief information officer or vice president of information systems is in demand because he or she is "someone with the big picture, experienced in strategic direction setting and in guiding the implementation of integrated systems to support revamped business processes." He finds there is no shortage of capable executives among the country's veterans who have spent their lives in information systems. And he believes many of them "can step into general management roles without difficulty." Six-figure salary packages are common for such talent, says Davis, noting that even in this market firms continue to offer a 25% premium to attract them as well as assurances of 15 to 20% in annual increases.

In this market, most companies, however, are looking for a "zero learning curve among their top and upper middle managers," says Davis, explaining that industry experience has become a requirement. "There is a desperate need for credibility in this highly competitive environ-

Where The Bucks Are

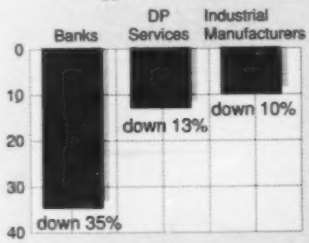
The East and West coasts are paying the best for the top IS slot, while the Midwest gets squeezed.

VP of IS, Average Salary

East Coast — $101,000
West Coast — $100,000
Midwest — $70,000

Who's Cutting Heads

Financial companies are planning the biggest staff cutbacks.



Who's Adding Bodies

High single-digit growth is occurring in four industry sectors.

Consumer Manufacturing — 7-9%
Distribution — 7-9%
Transportation/Utilities — 7-9%
Government — 4%

ment," he says, such as the IS executive for a retailer "who can talk to merchants as if he or she has known them for a lifetime."

Beyond the CIO, there are other upper echelon jobs going for $90,000 and over in larger firms. These, according to Davis, include:

- The database expert "not only skilled in logical and physical modeling" but also able "to reduce the technology to understandable business terms and to talk to the business issues which technology is supporting."
- The technology architect, the long-range planner for all information and communication technologies, "who can optimize the dollars spent on technology while optimizing the service delivered to end users."
- The expert in computer and communications security and risk management.
- The telecommunications manager knowledgeable about the complexities of planning voice and data networks and experienced in purchasing the right equipment and services in a deregulated environment.

> Somewhere it's etched in stone that managers must make more than people who report to them.

The Hybrid Professional

The need for people who combine technical and business knowledge has been cascading down into middle management and professional ranks. These include the systems analyst with expertise in marketing, manufacturing or other functions and the project leader adept at working with cross-functional teams.

Forrest Jerome, director of product development systems at New York City-based Colgate-Palmolive Co., feels "the days of the pure programmer or analyst are gone." For instance, he needs experts to develop integrated plant-floor systems—people who combine programming, engineering and process-control manufacturing knowledge.

Corporatewide, he says, "we need to support desktop devices—the PCs and Macs—in ways we didn't think about when they first started moving throughout the organization. We want people who not only can program on the Mac, using PASCAL or Fourth Dimension, but also have the experience in the type of PC-based LANs we're implementing and the ability to work with the users as a real member of the team. They have to understand what is going on in a business sense, participate in project teams with the user, and come back and translate their demands into code. That's a reach we haven't had before."

That's the point—as technology becomes more common in business, multitalented staffers are needed to make sure the technology has a true business impact. John Alexander, senior vice president and CIO at insurance firm UNUM Life Insurance Co. in Portland, Maine, points out that in-house training programs are filling the need for junior programmers and analysts. But he's been looking for people with such leading-edge skills as "knowledge-based systems, image processing and early stage cooperative distributed data experience in the PC LAN arena." His firm isn't just hiring heatseekers; it's building the capability to raise customer service and corporate performance to new levels.

He foresees a high demand for two new breeds of professional. One is "the workstation guru, who understands how to build applications that start with a graphical user interface and include a distributed data element." The application is partly done on the micro and partly in the mainframe or LAN server; or, in business terms, partly done in the branch, agent or broker office and partly done in the home office. With such an application, "one person fills out the insurance application, another does underwriting, and they are working from the same set of information," he says.

Another new breed is the person adept at integrating image processing, knowledge-based systems and conventional production data processing into either mainframe or micro-level applications. What this can mean in a business sense is illustrated by a multimedia, multifunctional application advertised by Wang Laboratories Inc. in Lowell, Mass., for property and casualty insurance. With this application, the various decision makers involved in a claim, wherever they are located, can display a photo of the damage, say to a car fender, call up the image of the customer's original claim forms and then, using a decision support process, rule on the claim and process it.

Companies are now committed to computer-aided software engineering and are looking for gurus who can both install the products and train application developers. In the mainframe arena, they want skills in current on-line and database systems, plus specific applications experience. In LANs, they need the expert who can select, install and support these networks, as well as LAN administrators. A new requirement is for microanalysts and programmers who can develop conventional business applications in a multimicro environment.

Some, like Joffe, believe that the rise of the technically savvy end user of the micro and the operational simplicity of powerful new systems such as IBM's AS/400 will slash the need for many IS professionals. But the increasing complexity involved in the integration of technologies and applications is creating new demand and new opportunity in this field.

So, Joffe believes, this is actually a good time for talented people to be looking for a job because many of the companies able to hire are those doing well. But, he advises, "Avoid the company looking to fill a need for the short term. Make sure the organization has a good long-range plan for information systems and network development and can offer a good career path." Again, the premiums for job-hopping "are not that great, so don't move for money alone unless you have a very hot skill, and you have not been paid exceptionally well where you are."

The ultimate word of advice for the IS professional is *optimize*. Optimize your income by optimizing skills that will optimize the business of the employer. ▭

Average Salary By Industry (In $)

	1990	CONSUM. MFG.	IND'L. MFG.	BANKING	FINANCE	EDP SERV.	DISTRIB.	GOV'T.
CORPORATE STAFF								
Vice President	85,089	110,000	72,500	76,000	45,000	97,000	90,000	62,489
Director of DP/MIS	65,816	72,066	63,286	91,667	50,500	83,667	43,000	52,285
Technical Services Manager	60,122	64,633	52,275	62,500	40,000	70,800	47,500	42,828
Information Center/Data Center Manager	50,778	67,670	44,200	N/A	30,000	56,400	47,500	46,234
Director of Security	48,320	45,000	39,000	65,000	N/A	47,500	N/A	37,932
SYSTEMS ANALYST								
Manager	52,178	55,750	51,083	66,000	34,750	57,667	47,000	43,802
Senior Systems Analyst	45,048	47,000	42,955	N/A	35,000	57,000	35,000	42,500
Lead Systems Analyst	43,052	41,260	45,000	48,000	N/A	41,500	N/A	42,000
Systems Analyst	39,411	34,500	44,000	N/A	25,000	44,500	44,000	35,000
Junior Systems Analyst	30,285	N/A	25,500	27,000	N/A	34,667	30,000	N/A
APPLICATIONS PROGRAMMING								
Manager	51,959	63,510	48,750	57,500	N/A	54,333	N/A	39,346
Lead Applications Programmer	37,320	30,333	37,200	N/A	N/A	50,500	N/A	31,932
Senior Applications Programmer	36,311	38,730	35,214	38,500	36,000	45,667	27,180	29,145
Applications Programmer	29,722	30,000	30,167	26,800	25,000	33,000	N/A	23,775
Intermediate Applications Programmer	28,403	23,000	32,250	28,500	N/A	28,500	13,971	22,667
Junior Applications Programmer	26,122	31,300	26,000	27,000	N/A	30,000	25,000	20,202
SYSTEMS ANALYST/PROGRAMMING								
Manager	52,543	46,000	54,386	N/A	N/A	53,250	56,500	46,331
Lead Systems Analyst/Programmer	44,686	41,945	51,207	N/A	N/A	53,333	42,333	37,955
Senior Systems Analyst/Programmer	38,862	35,690	43,321	52,000	31,800	46,000	39,667	35,385
Systems Analyst/Programmer	35,528	34,250	39,147	N/A	N/A	39,750	33,000	32,062
Intermediate Systems Analyst/Programmer	32,108	26,000	36,670	39,000	N/A	33,500	31,500	28,500
Junior Systems Analyst/Programmer	26,786	25,333	31,202	N/A	24,000	25,000	30,667	23,833
OPERATING SYSTEMS PROGRAMMING								
Manager	56,052	57,250	56,000	61,500	N/A	58,000	N/A	48,667
Senior Systems Programmer	44,318	42,200	43,932	70,000	N/A	32,334	36,500	43,162
Intermediate Systems Programmer	37,349	34,333	31,000	43,000	N/A	36,000	N/A	35,924
Junior Systems Programmer	32,427	23,212	25,000	35,000	N/A	46,000	N/A	32,136
DATABASE ADMINISTRATION								
Manager	53,426	40,000	53,547	50,000	N/A	63,667	N/A	41,551
Database Administrator	46,680	46,666	40,881	43,000	N/A	56,500	N/A	43,449
DATACOM/TELECOM/CONNECTIVITY								
Manager	52,228	42,000	46,750	75,000	42,000	55,000	N/A	42,699
Analyst	48,174	40,000	48,094	47,000	N/A	57,000	N/A	35,612
Network Engineer	44,626	N/A	37,000	42,000	N/A	43,000	N/A	38,506
Network Administrator	33,077	31,000	31,500	32,000	N/A	32,000	N/A	39,924
COMPUTER OPERATIONS								
Manager	43,356	36,000	43,500	39,333	N/A	47,667	44,800	42,793
Shift Supervisor	33,542	30,516	31,586	47,000	N/A	37,333	30,500	36,576
Lead Computer Operator	25,029	24,265	23,259	26,250	20,000	27,750	24,146	27,118
Computer Operator	21,090	19,772	18,500	28,000	N/A	24,033	19,380	23,080
Microcomputer/Workstation Manager	38,974	42,000	20,000	47,000	N/A	N/A	N/A	35,234
PRODUCTION & I/O CONTROL								
Supervisor	33,941	34,000	28,000	28,000	N/A	38,500	N/A	30,000
Lead Production Controller	28,681	31,058	24,000	22,000	N/A	30,000	N/A	24,850
Scheduler	26,711	26,638	22,875	19,000	N/A	24,000	32,000	22,000
Control Clerk	19,677	19,196	18,516	16,000	N/A	24,000	22,000	17,074
DATA ENTRY								
Data Entry Supervisor	23,341	23,500	23,667	34,000	18,000	24,667	27,000	22,000
Data Entry Operator	20,040	17,261	24,217	13,000	18,500	18,000	19,003	18,250
OFFICE AUTOMATION								
Word-Processing Supervisor	28,000	23,000	18,000	N/A	N/A	15,000	50,000	28,000
Word-Processing Operator	22,418	19,000	18,625	N/A	N/A	N/A	22,000	23,000
Microcomputer User Services Specialist	29,560	36,866	21,000	48,000	N/A	N/A	N/A	23,312
OTHER								
Specialist	24,794	N/A	25,000	18,000	N/A	30,000	20,000	20,000
Consultant	54,584	45,000	50,000	87,000	N/A	59,000	100,000	31,848
PC Evaluator	33,657	31,380	35,451	N/A	N/A	N/A	N/A	36,324
Business Analyst	45,333	N/A	40,000	66,000	N/A	N/A	N/A	N/A

			COMPANY SIZE							
MED./ LEGAL	TRANS./ ED/CONST.	OTHER	<$10M	$10M- $24.9M	$25M- $99.9M	$100M- $249.9M	$250M- $499.9M	$500M- $999.9M	$1- $2.9B	3B+
N/A	106,800	50,000	59,600	70,000	110,000	69,906	102,000	95,000	112,000	105,000
56,200	66,143	71,278	46,600	55,000	61,369	65,508	68,563	75,625	82,000	104,000
55,000	71,000	62,500	N/A	61,980	50,257	63,000	63,000	67,000	51,667	73,000
41,025	49,017	88,000	35,000	46,000	47,589	44,759	49,500	54,000	68,333	75,667
N/A	63,525	N/A	15,000	46,500	56,000	38,796	N/A	45,000	61,636	45,500
60,000	53,600	58,667	62,500	36,500	53,100	48,471	55,500	49,000	54,100	60,667
50,000	41,250	48,000	45,000	29,500	41,167	44,667	40,625	53,333	52,250	60,500
N/A	40,000	N/A	N/A	N/A	43,303	N/A	40,000	N/A	41,167	50,000
45,000	32,052	40,000	34,000	N/A	36,509	41,000	N/A	33,333	41,333	58,500
N/A	N/A	N/A	40,000	N/A	25,333	N/A	N/A	N/A	33,000	30,000
60,000	55,667	50,000	43,750	47,000	53,010	47,081	50,000	60,000	59,333	71,667
N/A	38,000	25,000	33,000	26,500	39,500	26,283	40,333	N/A	50,000	58,000
50,000	55,000	36,667	28,500	N/A	34,397	34,802	37,667	35,000	43,136	50,000
32,012	38,500	33,000	24,250	26,500	30,500	29,340	27,208	35,000	40,333	40,000
32,000	45,000	N/A	19,667	N/A	22,990	32,000	29,040	N/A	36,667	40,000
N/A	28,000	22,500	14,000	N/A	25,400	25,000	21,500	32,000	31,000	36,500
70,000	59,795	51,971	52,500	49,200	42,000	50,331	52,214	54,533	57,250	51,000
38,200	45,040	47,750	50,000	43,000	44,890	31,848	44,594	53,400	44,333	44,000
30,000	39,092	40,750	50,000	38,333	58,746	38,800	37,061	41,761	41,250	35,500
28,000	36,987	36,775	45,000	30,000	34,375	33,500	33,987	37,776	36,400	42,275
N/A	29,000	28,200	35,000	27,000	33,333	35,000	27,900	34,674	33,000	50,000
18,000	25,000	N/A	21,000	N/A	26,400	N/A	24,000	34,004	31,750	28,500
N/A	49,000	62,500	47,500	50,000	65,500	55,000	47,000	59,250	54,500	63,500
54,000	54,700	55,000	55,000	20,000	45,667	38,162	43,100	51,398	46,500	40,000
N/A	55,000	40,000	N/A	N/A	43,000	29,949	30,000	42,500	43,667	32,000
26,500	40,000	30,000	63,000	33,213	33,333	20,000	23,000	23,000	35,000	27,000
N/A	75,000	65,000	63,000	28,500	64,000	38,182	N/A	63,094	62,667	65,000
50,000	60,000	45,140	70,000	N/A	45,500	37,962	35,567	48,257	49,000	52,500
55,000	62,500	60,000	25,000	48,500	59,333	50,159	47,000	53,500	66,000	61,000
45,000	60,000	53,400	18,000	N/A	43,500	41,279	48,600	58,094	54,000	53,500
N/A	60,000	55,000	N/A	50,000	42,000	27,012	N/A	N/A	48,667	37,000
N/A	45,000	25,000	N/A	N/A	29,000	29,462	38,000	N/A	41,667	25,000
38,460	59,667	43,150	35,143	42,333	38,600	40,981	39,097	49,333	53,229	57,333
26,000	39,400	27,500	25,000	17,000	34,280	29,924	31,050	34,000	40,625	39,000
20,364	29,667	29,950	19,900	21,933	24,841	26,169	22,115	22,667	32,500	28,000
22,000	25,552	16,250	14,750	18,000	20,266	20,567	21,043	20,000	25,143	29,333
55,000	N/A	36,250	40,000	N/A	47,000	36,324	32,500	42,000	N/A	20,000
N/A	50,000	39,500	36,000	32,500	27,667	33,000	35,000	42,000	38,667	20,000
N/A	45,000	N/A	N/A	30,000	23,558	23,700	30,000	37,000	33,667	18,000
N/A	40,000	35,000	N/A	N/A	19,458	N/A	25,312	31,667	29,500	18,000
N/A	23,000	20,000	N/A	16,068	17,639	18,574	19,016	21,500	23,250	15,000
16,644	N/A	19,750	23,000	24,167	27,000	22,000	22,322	27,000	23,000	18,000
14,250	21,500	18,000	25,625	19,017	18,335	19,333	17,907	21,000	17,875	15,000
N/A	37,500	15,000	15,000	N/A	23,000	N/A	37,500	N/A	39,000	18,000
N/A	24,107	32,500	19,500	28,000	20,303	26,000	N/A	N/A	22,500	16,000
18,000	60,000	N/A	19,000	N/A	34,850	29,000	18,000	N/A	36,500	14,000
N/A	3	10,400	23,467	20,000	N/A	N/A	23,772	N/A	27,667	27,000
N/A	N/A	20,000	100,000	35,000	53,500	31,848	N/A	N/A	32,000	65,000
20,000	55,000	40,000	20,100	N/A	43,190	36,324	25,678	N/A	55,000	N/A
N/A	N/A	30,000	N/A	N/A	66,000	30,000	N/A	N/A	N/A	40,000

Source: DATAMATION

Average Salary By Region (In $)

	1990	EAST COAST	SOUTH-EAST	MID-WEST	SOUTH-WEST	WEST COAST	OTHER
CORPORATE STAFF							
Vice President	85,089	101,000	87,500	70,000	77,859	100,000	N/A
Director of DP/MIS	65,816	77,944	54,347	66,200	54,162	78,566	40,500
Technical Services Manager	60,122	62,122	61,400	70,000	50,664	57,829	60,000
Information Center/Data Center Manager	50,778	51,364	42,600	61,167	50,871	56,204	30,500
Director of Security	48,320	50,750	32,500	47,000	43,285	67,525	N/A
SYSTEMS ANALYST							
Manager	52,178	53,250	60,500	56,625	44,051	57,300	N/A
Senior Systems Analyst	45,048	47,591	49,333	37,500	38,833	55,000	33,500
Lead Systems Analyst	43,052	43,000	45,000	38,256	45,000	44,010	N/A
Systems Analyst	39,411	39,857	46,000	34,800	41,013	43,000	30,000
Junior Systems Analyst	30,285	27,500	38,000	N/A	25,500	30,000	N/A
APPLICATIONS PROGRAMMING							
Manager	51,959	54,446	41,833	56,250	51,122	61,510	39,000
Lead Applications Programmer	37,320	30,667	39,250	28,667	38,145	44,600	35,000
Senior Applications Programmer	36,311	40,000	31,420	32,670	35,547	45,653	22,500
Applications Programmer	29,722	28,000	26,933	25,250	28,719	41,200	28,000
Intermediate Applications Programmer	28,403	31,333	20,994	25,540	33,000	36,667	N/A
Junior Applications Programmer	26,122	27,857	20,750	N/A	26,202	28,400	N/A
SYSTEMS ANALYST/PROGRAMMING							
Manager	52,543	53,500	62,167	52,509	45,018	51,036	42,000
Lead Systems Analyst/Programmer	44,686	52,250	48,276	42,720	37,555	45,680	34,000
Senior Systems Analyst/Programmer	38,862	48,500	40,333	37,313	37,385	40,521	31,000
Systems Analyst/Programmer	35,528	37,750	36,009	35,017	36,338	36,360	30,000
Intermediate Systems Analyst/Programmer	32,108	37,000	29,250	31,058	34,533	34,000	N/A
Junior Systems Analyst/Programmer	26,786	29,000	23,400	28,602	30,833	26,000	22,000
OPERATING SYSTEMS PROGRAMMING							
Manager	56,052	66,143	41,500	41,000	51,500	63,333	N/A
Senior Systems Programmer	44,318	45,250	39,000	41,518	45,331	47,600	N/A
Intermediate Systems Programmer	37,349	38,600	36,000	23,000	31,924	47,500	N/A
Junior Systems Programmer	32,427	31,600	25,713	31,500	37,852	31,667	N/A
DATABASE ADMINISTRATION							
Manager	53,426	65,000	48,000	42,063	42,841	70,000	78,000
Database Administrator	46,680	48,000	36,000	45,642	44,341	49,167	N/A
DATACOM/TELECOM/CONNECTIVITY							
Manager	52,228	63,625	36,667	44,000	41,449	60,000	28,000
Analyst	48,174	52,800	30,000	61,188	37,479	56,250	N/A
Network Engineer	44,626	46,000	36,000	N/A	32,006	55,000	N/A
Network Administrator	33,077	35,000	32,000	36,000	28,424	33,500	N/A
COMPUTER OPERATIONS							
Manager	43,356	46,258	43,875	40,229	40,914	53,600	N/A
Shift Supervisor	33,542	34,178	33,000	28,000	34,745	33,130	32,000
Lead Computer Operator	25,029	25,957	23,081	23,089	23,771	31,258	21,500
Computer Operator	21,090	23,109	18,171	19,734	22,000	24,095	18,000
Microcomputer/Workstation Manager	38,974	48,000	N/A	40,000	28,162	32,500	N/A
PRODUCTION & I/O CONTROL							
Supervisor	33,941	34,250	34,000	27,500	32,500	40,000	35,000
Lead Production Controller	28,681	29,667	30,000	N/A	20,850	32,039	30,000
Scheduler	26,711	27,400	25,812	32,000	18,000	27,305	N/A
Control Clerk	19,677	19,200	20,700	22,000	16,049	22,305	N/A
DATA ENTRY							
Data Entry Supervisor	23,341	26,400	25,667	19,167	26,500	23,000	N/A
Data Entry Operator	20,040	19,500	17,526	17,794	20,750	30,400	20,000
OFFICE AUTOMATION							
Word-Processing Supervisor	28,000	19,000	45,000	50,000	24,000	28,000	N/A
Word-Processing Operator	22,418	N/A	14,750	20,333	22,702	29,333	N/A
Microcomputer User Services Specialist	29,560	35,500	17,000	25,750	23,750	48,700	22,000
OTHER							
Specialist	24,794	19,000	45,000	19,000	23,500	34,772	N/A
Consultant	54,584	74,000	40,667	20,000	60,616	N/A	N/A
PC Evaluator	33,657	38,500	14,776	40,000	36,324	43,190	N/A
Business Analyst	45,333	66,000	N/A	N/A	40,000	30,000	N/A

Source: DATAMATION

A United Approach To PC Purchasing

Although PCs have been taken seriously in the office for years, IS departments and end users are still at odds over how to handle PC purchasing. But by setting philosophical differences aside, a few firms are finding a successful middle ground.

BY DENNIS HAMILTON

In the late 1970s, the Bank of Boston gained some notoriety when, in embracing personal computing, it allowed users free rein to buy whatever they thought they needed. In the end, almost everything had to be scrapped as incompatible and impossible to maintain.

In the ensuing years, companies and their IS departments have tried various combinations of user freedom and central IS control in search of a lucid PC acquisition process. But even after purchasing some 45 million PCs, companies are finding that their acquisition remains a center of chaos.

Even though the free-rein theory has been discredited for more than a decade, many user departments are following it anyway and finding scant resources to help them make decisions. For a while in the mid-1980s, IS attempted to take control of the PC acquisition process. But a lingering disdain for the machines, along with nagging questions about who should pay for them, support them and program them, left users feeling jilted. Compounding the difficulties was the view from the opposite extreme, usually held by operating departments, that PCs were the solution to everything.

"What I notice with my clients, even those with big MIS departments, is that they seem to be getting more and more independent of MIS in their purchasing decisions," observes Michael Piaser, vice president of information-processing center services for Management Reports Inc. (MRI), a Beachwood, Ohio, data-processing services bureau that helps clients acquire PCs. "And they're screwing it up right and left."

"PC prejudice or mainframe prejudice are hard things to overcome," says Neil Hennessy, director of corporate communications and office systems for Reader's Digest Association in Pleasantville, N.Y. "You have this real battle going on with what I call classical DP and the little guys." To escape the battle, users have tried other outside sources, only to find their recommendations not always in agreement with their companies' overall IS strategy. Says consultant Piaser: "These poor users are trusting hardware companies, and the hardware companies are wrong most of the time."

In the final analysis, the IS department—which should be wired more precisely into corporate computing needs and business requirements than anyone from the outside—is most often the best choice to lead the PC acquisition process. But, in many cases, IS is defaulting. "There's a schism in data processing, and it's brought about mainly because mainframers can't think PC. The foot drag-

STATE OF GEORGIA'S CAWLEY: Traditional IS managers need to get away from floating point decimal problems and spend more time addressing PCs, people and the bottom line.

ging is in the mainframe arena," says Edward Cawley, data center manager in Savannah for the State of Georgia.

The LAN Factor

The explosion of local area networks in the past two years could be the catalyst that finally spurs coherent IS involvement in PC acquisitions. At the heart of the LAN movement is the fact that PCs aren't just for individuals anymore. "You only get corporate productivity when you have the PCs work together," maintains Dan Ness Jr., an industry analyst for Computer Intelligence, a La Jolla, Calif., market research firm.

Too often today, however, IS departments still hold out all but token cooperation when it comes to integrating PCs into companywide networks. "I'm trying to think of one instance where the MIS department was involved in the LAN acquisition [for a client], and I'm coming up short," confesses Piaser of MRI.

□ PC Acquisition Remains A Center Of Chaos For Many Companies.

Some believe the resistance comes from business culture and computer politics. "A lot of mainframe people can get inside logic modules and floating point decimals, but they can't address themselves to the bottom line," says the State of Georgia's Cawley.

Making matters worse is a problem with the IS work load. Piaser reasons that if IS appears to lack initiative in leading the PC acquisition process, it's because many don't have the hours in a day to figure it out. "You talk to them, and they're so stuck doing maintenance and mainframe requests and mini requests that they don't have time. This [work load] hasn't decreased one iota just because PCs are out. It might even be worse."

The Problem At The Top

Although IS departments shoulder much of the blame for not pursuing coherent PC acquisition strategies, they are not the only ones at fault. Many believe that top management has ignored the problem.

Notes Piaser of MRI, many top managers were too easily swayed by the ease-of-use hype concerning PCs and PC LANs from a number of computer and networking manufacturers. Many of those assumptions turned out to be wrong, based on the popular myth that PCs—and by extension LANs—are so simple that they virtually run themselves. Consequently, many top managers today underestimate the need to formally educate highly skilled computer technicians about these simple machines.

Meanwhile, end users have hurt their case by purchasing PCs on their own with petty cash, sometimes hiding the acquisition altogether by listing it on the budget as a filing cabinet. Pressed between top management's nonchalance and user departments' troublesome initiative, IS reluctance to forcefully sort out the process becomes more understandable.

Signs Of Détente

There are signs, however, that some IS shops are attempting to formally acknowledge the role PCs are playing in corporate computing. The key appears to be a strategic corporate commitment, from top management on down, that system acquisitions should not be done by size of computer but rather with the best solution in mind.

The transition from PCs to LANs is what's behind this change in attitude. "They [LANs] give users that much more in resources. But they also give the IS department its control back to a certain extent," maintains Mark Stokes, information systems resource manager for the Computer Resources Group Inc. (CRG), a San Francisco-based consulting firm. What IS has to concede, is that this new form of control is not absolute. "We've grown out of that chaos and learned some serious lessons. One of them is that you can't control everything in the PC world.

"It really depends on the corporation's attitude," Stokes adds. Although there's still a lot of "diversity"—a code word for a motley assortment of varyingly successful PC acquisition programs—he sees a positive trend emerging. This is where the more successful companies form teams composed of IS members and end users. These teams then set PC acquisition policy and carry out large PC purchases together.

A Horizon Of Hope

Analyst Ness of Computer Intelligence also sees considerable crossover between once-separate IS and PC departments. Computer Intelligence conducts a monthly survey of 1,500 mainframe sites with 500 or more employees. One area

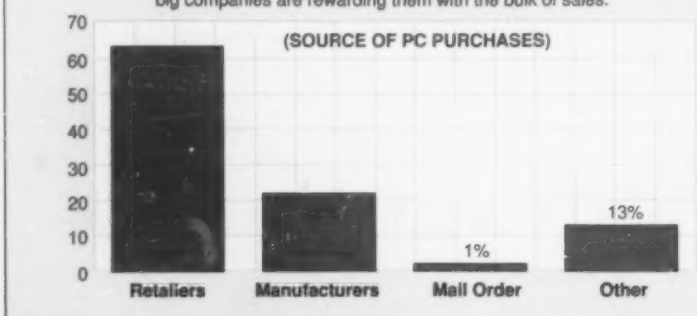
PC Purchasing: A Matter Of Policy

Relatively few large companies have perfected their PC buying techniques. But among those that do have effective policies, the following eight traits are usually shared.

1) No absolute center of computing power is apparent.
2) IS and operating departments work together.
3) No one buys equipment outside of the agreed-upon standards and guidelines.
4) IS makes an open commitment to PCs where they are the best solution.
5) Money for equipment comes from user departments.
6) IS accepts PCs into the formal IS umbrella.
7) IS appoints full-time PC coordinators.
8) IS agrees to learn—and talk—business.

PC Purchasing Channels For Large Companies

As computer retailers increase their level of PC service, big companies are rewarding them with the bulk of sales.



Source: Computer Intelligence Corp.

it studies is PC-purchasing trends, and here Ness concludes changes are happening. "In the last couple of years," he says, "people have emerged whose titles are PC coordinator and end-user computing coordinator. They are leading the process." And, he says, many are full-fledged members of the IS team.

Driven by the IS issues of connectivity and standardization, the acquisition of PCs is quietly becoming formal and successful in some organizations. One way that many large companies are standardizing their purchases is by relying more on the expertise of certain retail computer stores. "Two-thirds of the computers are being purchased through retailers and dealers such as Businessland and ComputerLand," says Ness. Only about one in five of the PCs are coming directly from manufacturers. And only 1% of the PC acquisitions are via mail order.

One reason for the retailers' success is that computer stores are investing in production facilities that can deliver tailored machines en masse. MicroAge Computer Inc., for example, maintains a 275,000-square-foot National Accounts Distribution Center in Tempe, Ariz., which caters to the specific needs of corporate accounts. The facility can configure up to 1,000 computers per day for shipment, including interface boards, LAN cards and software.

Retailers are also making it easier for large companies to finance their PC purchases. "We're finding a lot of the large corporations going the lease route because they don't have to carry the PCs on their books," says Michael D. Reese, sales manager for a MicroAge store in Indianapolis. "It's a write-off to the bottom line."

Reese adds that leasing companies have become more creative in their leases, pulling together master-lease packages that allow companies to add computers when they need them. "They will even allow trade-ins if they meet certain requirements for resellability," he says. "All of this allows companies to move up to the next level in the PC market when they're ready to, at virtually no extra cost to them."

How Reader's Digest Purchases PCs

The Reader's Digest Association has gotten big by thinking small. Thanks, in part, to its successful PC acquisitions program, the association's diminutive magazine continues to be one of the most widely read publications in the world.

Neil Hennessy, the director of corporate communications and office systems for Reader's Digest Association in Pleasantville, N.Y., is in charge of PCs for the company. He also is a full-time member of the company's IS management team, is a director in the data-processing department and sits on the committee that buys mainframe equipment. In other words, he is the exception to the rule that says PCs and PC managers are renegades.

PCs have assumed a measurable percentage of the processing work load at the Reader's Digest. "If you could represent it in horsepower," says Hennessy, "our big computer [an IBM 3090] downstairs has 85 horsepower. There's 2,100 horsepower sitting on the PC networks." Approximately 300 more PCs are added to the stew each year, and Hennessy is charged with making sure everything works correctly, including user requirements, budgets, hardware, software and micro-to-mainframe connectivity.

According to Hennessy, a simple organizational change in the IS department is largely responsible for making PCs a consideration in every systems discussion. Where the department was once organized vertically, by technology—voice communications, data communications, PCs, applications, etc.—things now have been reordered horizontally by function. For example, a field-engineering group installs PCs, telephones and terminals, and a networking group handles all voice and data communications.

Hennessy's acquisition procedures involve a mixture of fixed and flexible elements. He sends out requests for PC acquisition forecasts at the beginning of the year to all user department heads, including the IS department. The departments then return a schedule telling him what types of PCs they want. Decisions are made with the technical advice of an analyst from the office systems group working closely with the department heads.

The teamwork-oriented acquisitions process is one that Hennessy believes would work well at practically any large company. "Those who don't take a hold of it now are going to have a heck of a time trying to put it together in two years," he says.

"They are the ghosts of people you've fired."

A Large Role For IS

If the events of recent history are any lesson, IS departments—not users or top management—must take the initiative in establishing clean PC acquisition processes. PCs aren't typewriters, and LANs aren't telephone extensions. The inexorable demand for enterprise computing environments has conspired to drop PCs right back in the lap of IS. The question now is whether IS embraces the possibilities or brushes them off. A lot hinges on the answer, but many managers will need philosophical breakthroughs even to admit a PC coordinator onto the IS team.

"What the user department wants to hear is that it really won't be his problem," says Piaser of MRI. "If MIS comes in and takes the problem away, the user is going to be a lot happier." ▭

Dennis Hamilton is the founder and principal of Software Analytics, an Indianapolis-based computer technology research firm.

How To Recruit Trading Partners

Recruiting trading partners is often the most costly element when a company begins instituting electronic data interchange. Here are five ways to set up a successful program.

BY SHARON CLARK

All dressed up and nowhere to go.

Unfortunately, even the most enthusiastic electronic data interchange (EDI) proponents may find themselves in that situation. Sure, the company is committed to EDI for exchanging important business documents, but will its partners go along? After all, there are only about 10,000 businesses currently using EDI, which hardly makes the technology universal. If your company's potential trading partners are not already thinking along EDI lines, you will have to invest time and money to sign them up.

In fact, a 1988 survey by Coopers & Lybrand found that trading partner conversion costs represented the single highest component (34%) of major EDI costs (see box, "The Cost of EDI Conversion").

Since educating and signing up trading partners is so expensive, companies need to find an efficient way to do it. This article offers five approaches. Each approach will attempt to perform two tasks: 1) determine the trading partner's knowledge, commitment, requirements and objections to EDI and 2) educate the trading partner as to the purpose, benefits and cost of EDI implementation.

Each description includes the primary steps needed to implement the approach, advantages and disadvantages and estimated time of completion. The time estimates are based on a company with 3,000 trading partners in 30 regions and 20 company representatives who establish contact with the trading partners.

1. Direct mail campaign. Mail an information packet to the contact person at each of your trading partners. The information should explain the purpose, benefits and costs of implementing EDI. It should also include a questionnaire that will help you assess the trading partner's knowledge, commitment, requirements and objections to using EDI.

Advantages of this alternative are that it is cost effective, that you can potentially contact 100% of your trading partners and will get written feedback.

Disadvantages are that you will probably receive less than a 100% response (30% would be considered high), the questionnaires may be slow to return and a trading partner might not be able to get a feel for your commitment or the other trading partners' commitment to EDI. You may also not be able to ascertain the true commitment of the trading partners.

Estimated time for completion is approximately one week for investigating trading partners' current EDI participation, three weeks for preparing the information packet and questionnaire, two weeks for testing the packet and questionnaire, two weeks for printing the packet and preparing it for mailing, six weeks for receiving the questionnaires back, two weeks for analyzing survey results and 12 weeks for pilot testing the EDI implementation. Total: 28 weeks.

2. Individual contact. Hold a rap session with the end users of each trading partner's company, one company at a time, and hand out questionnaires that you can analyze later. Present the purpose, benefits and cost of implementing EDI.

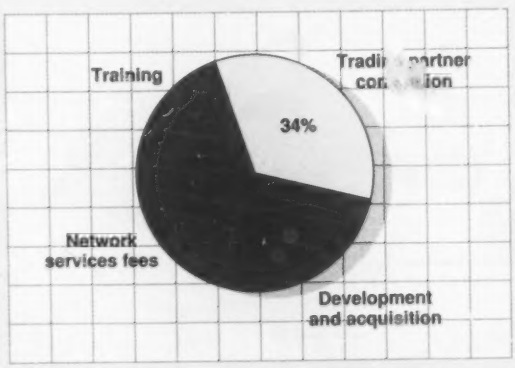
Advantages are that you can contact 100% of the trading partners, have maximum control over the quality of information given, receive a 100% response from your partners and react to their responses immediately.

Disadvantages are that it is the most costly approach and is potentially the most time-consuming method, depending on the number of contact representatives you have.

Estimated time periods for this approach are approximately one week for investigating trading partners' current EDI participation, three weeks for preparing information and questionnaire, two weeks for testing the packet and questionnaire, two weeks

The Cost Of EDI Conversion

Surprisingly, trading partner conversion accounts for the biggest share of every dollar spent implementing EDI.



Source: Coopers & Lybrand

for training the representatives to go out to the trading partners, 30 weeks for contacting each trading partner, two weeks for analyzing responses and 12 weeks for pilot testing EDI implementation. Total: 52 weeks.

3. Regional group seminars. Instead of contacting companies one at a time, you can hold a big group rap session with the contact people from a number of trading partners in an entire region. Distribute a questionnaire to get feedback.

The cost for this method is moderate, and group participation opens the way for expanding each trading partner's thinking about EDI.

However, fewer than 100% of the trading partners will attend, since finding a convenient time to gather all trading partners will be impossible. Responses to the questionnaires will be less personal if you distribute them in a group.

Estimated time periods for the regional group rap session approach are based on two-day seminars (two per week), 20 representatives (10 representatives per seminar), 30 regions and 100 participants per seminar. You will need approximately one week to investigate trading partners' current EDI participation, three weeks for preparing the information for the seminars, two weeks for training representatives, three weeks for contacting trading partners (phone and letter), 15 weeks for holding the seminars, two weeks for analyzing seminar responses and 12 weeks for pilot testing EDI implementation. Total: 38 weeks.

4. **Select group.** Hold a group meeting with the "top" trading partners—those providing 85% of your transaction volume. Then personally contact the top trading partners who were absent.

With this approach, you maximize your return on your investment. You expand the knowledge of the trading partners by having group discussion and feedback. You create a pilot group to test the new system, and you can have an up and running system in less time.

The disadvantage is that you contact fewer than 100% of the partners.

Estimated time periods expected for this alternative are based on having approximately 600 trading partners and holding 10 seminars with 10 representatives. You will need approximately one week for investigating trading partners' current EDI participation, three weeks for preparing the information packet, two weeks for training representatives, five weeks for holding seminars, two weeks for making personal contact with trading partners not attending a seminar, two weeks for analyzing the seminar results and 12 weeks for pilot testing EDI implementation. Total: 27 weeks.

5. Combination of individual contact and regional group meetings. Visit the contact person from each of the top trading companies individually, giving a presentation of the purpose, benefits and costs for implementing EDI. Follow that with a rap session with the end users at each of these companies. Then back this up with regional group seminars with the smaller companies.

☐ ONLY ABOUT 10,000 BUSINESSES ARE CURRENTLY USING EDI.

This approach is cost effective in terms of both time and money. You have a chance to give immediate feedback to participants' responses. And you achieve a reasonable compromise in the quality of information you give.

However, fewer than 100% of the trading partners will attend the group seminar, and the responses will be less personal if a group-distributed questionnaire is used.

Estimated time period is one week for investigating trading partners' current EDI participation, three weeks for preparing the information, two weeks for training the representatives, six weeks for making individual contact, 12 weeks for holding group seminars, two weeks for analyzing results and 12 weeks for pilot testing EDI implementation. Total: 38 weeks.

Choosing The Best Way

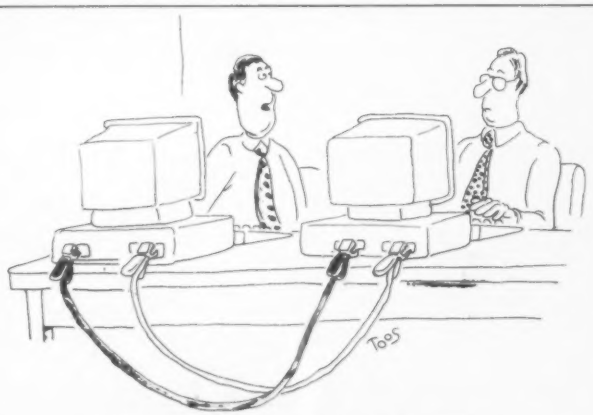
In choosing among these five methods, consider cost, implementation time and the ability to convince trading partners to adopt EDI. Once you know the type, size and location of the trading partners; the transaction volume generated with those companies; and the number of representatives available from you company to handle the personal contact or seminars, you will be able to pinpoint the best approach for your company.

The constant costs for all of the alternatives include investigating current EDI participation, preparing EDI information, preparing the questionnaire, printing the information and the questionnaire and analyzing the responses.

The only additional expenses incurred by the direct mail campaign are for postage and envelopes. The other approaches have the added expenses of training representatives to make personal presentations, making phone calls and mailing a follow-up letter.

Approaches 2, 4 and 5 require additional expenses for making individual contacts with partners. Alternatives 3, 4 and 5 incur costs for seminars.

"Although technology is involved in EDI, the most important ingredient is people," says *The Petroleum EDI Digest*. "People implement EDI." Only when you work together with your trading partners will you reap the benefits of EDI. Isn't it time you and your trading partners take the first step in joining efforts to gain the strategic advantages of a paperless way of doing business? ▭



"Now, when we *really* start doing EDI, we won't have to sit next to each other."

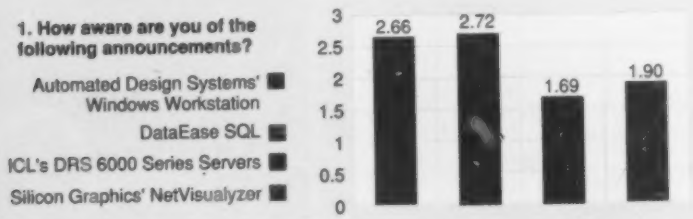
Sharon Clark is a lecturer in MIS at Texas Christian University in Ft. Worth.

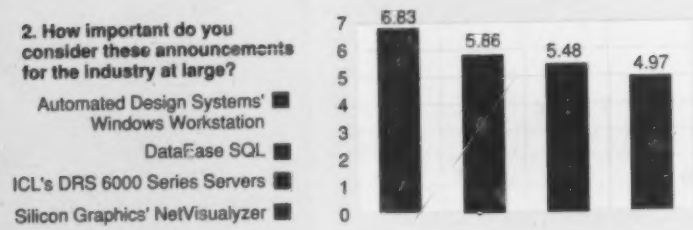
ADS's Windows Utility Gets High Marks

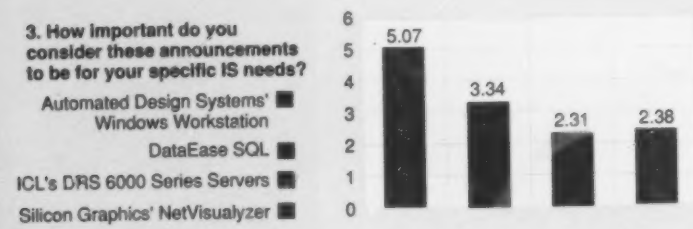
DATAMATION'S USER PRODUCT REVIEW

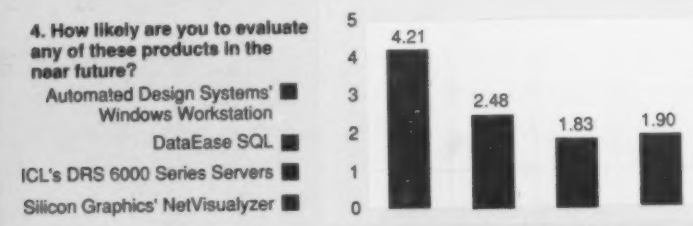
Pick of the Pack

The DATAMATION Review Panel was asked the following four questions for each product. Panel members were asked to respond on a scale of 1 to 10, with 1 meaning ""not very" and 10 meaning ""extremely." The results represent the average of all responses for each question.









The Lineup

In August, **Silicon Graphics Computer Systems Inc.** of Mountain View, Calif., introduced the NetVisualyzer Data Station software for remote monitoring of network activity. Priced at $4,000, the software runs on the company's workstations and allows IS managers to track network traffic patterns, security breaches and changes in network configuration from one location.
Circle No. 590

Also announced in August was Windows Workstation, release 3 from **Automated Design Systems Inc.** of Atlanta. The Microsoft Windows 3.0-compatible set of software utilities is designed to make network connections and administration easier under the Windows operating environment. It is priced at $695.
Circle No. 591

International Computers Ltd. of Irvine, Calif., announced in August two new servers based on Sun Microsystems Inc.'s Scalable Processor Architecture (SPARC) Reduced Instruction Set Computing (RISC) architecture that run industry standard UNIX System V release 4.0. The company says the servers, priced from $160,000, let users run standard UNIX software packages on fast SPARC platforms.
Circle No. 592

Trumbull, Conn.-based **DataEase International Inc.** unveiled its DataEase SQL application development software for relational databases in August. The product allows users to access data in disparate databases transparently through Structured Query Language (SQL) in a client/server environment. Prices start at $995.
Circle No. 593

DATAMATION's User Product Review is conducted twice a month by a panel of the magazine's readers. Panel members base their judgments on published information about each of the products under review. Their responses are sent to DATAMATION by fax. If you wish to join the User Product Review Panel, call Bob Sawyer, Senior Editor, New Products, at (617)-558-4438; write to him at 275 Washington St., Newton, MA 02158; or fax him at (617)-558-4506.

Is An Upturn In The U.S. At Hand?

BY MADELINE FRANCHI
Cahners Economics

There's bad news and good news in DATAMATION's Information Systems Performance Indicator. Sad to say, our statistical amalgam of U.S. orders for computers and other economic indicators relevant to the computer industry hasn't been this low since early 1987. Happy to predict, however, the indicator should climb for the next 18 months—barring unforeseen events in the Persian Gulf.

The indicator has been descending since early 1989, when users began to rein in their information technology spending. They had good reasons. They could see that the engines of U.S. economic growth in the 1980s—financial services, real estate transactions and deregulation initiatives—were starting to sputter. They could see the advantages of investing in lower-priced distributed systems instead of big ticket host models.

In June, the latest month for which hard numbers (versus forecast) exist in DATAMATION's indicator, IS performance dropped to 100.7 with declines in three out of the indicator's five components. New U.S. orders for systems, one major component, slipped for the third straight month.

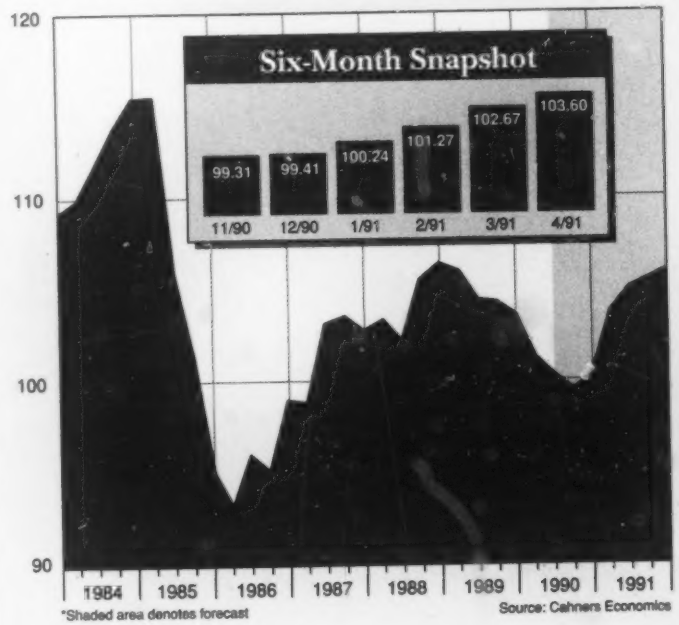
Evidence that another component, inventories at U.S. computer manufacturers, dipped in June was actually a good sign—one of many leading us to forecast a sustained recovery for the industry. Declining inventories signals that manufacturers are managing their businesses with foresight. They aren't suffering from an involuntary buildup of inventory, which would signal a more devastating and prolonged downturn. With inventory levels low, the anticipated pickup in demand in 1991 should trigger an immediate increase in production.

Methodology

The DATAMATION Information Systems Performance Indicator tracks the economic health of the IS industry. Cahners Economics developed this indicator, which is based on weighted moving growth rates for five statistics: (1) information systems inventory, (2) new IS orders, (3) average weekly hours of computer industry production workers, (4) Standard and Poor's computer system stock price index and (5) contracts and orders for plant and equipment. For more information on Cahners Economics's forecasting services contact Dan Buchan by phone at (617)-630-2105; by fax at (617)-630-2100; or write to him at Cahners Economics, 275 Washington Street, Newton, MA 02158.

The IS Performance Indicator

We should be at the bottom of a trough in the U.S. computer industry.



*Shaded area denotes forecast

Source: Cahners Economics

	June 1990	May 1990	% Change 5/90-6/90	June 1989	% Change 1989/1990
■ Information-Processing Equipment					
Shipments (SA, $ millions)	9,916	9,781	1.4	9,769	1.5
New Orders (SA, $ millions)	9,676	9,787	-1.1	8,833	9.5
Unfilled Orders (SA, $ millions)	28,346	28,586	-0.8	27,669	2.4
Inventory (SA, $ millions)	20,867	21,646	-3.6	21,548	-3.2
■ Computer Production Workers					
Employment (NSA, thousands)	126.3	124.8	1.2	129.7	-2.6
Average Weekly Hours (monthly avg.)	42.1	41.8	0.7	41.6	1.2
■ Stock Index					
S&P's Computer Systems Stock Price Index	196.31	191.97	2.3	190.95	2.8
■ Contracts & Orders					
New Plant & Equipment (SA, $ billions)	39.94	40.57	-1.6	44.07	-9.4

SA= seasonally adjusted;
NSA= nonseasonally adjusted

Sources: U.S. Commerce Dept. and Standard & Poor's; forecasts Cahners Economics

Software Engineering Tools Grip Users

BY WARREN CHILDS
Business Research Group

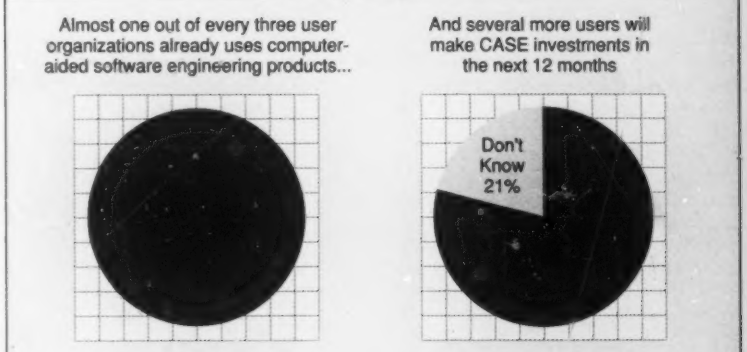
Hardly any other advance in information technology has caught on as fast as computer-aided software engineering. Large and medium-sized user organizations are investing in CASE tools by the droves, propelling the market to an estimated $2 billion in 1990.

More than a third of all the user organizations represented in DATAMATION's High Technology Panel already have bought CASE tools. Such interest is understandable given the potential of such tools to reduce the backlogs of requests within user organizations to develop new software applications—backlogs running as long as two years.

As useful as CASE tools appear to be, the money, training and time needed to implement them throughout a user organization are somewhat inhibiting. So while 36% of our panel members are using CASE products in some fashion, few are actually employing such engineering tools throughout their enterprises. Most are either just evaluating CASE tools they have purchased or applying them very selectively.

Understandably, those CASE tools that help at the beginning of software development—in the analysis and design phases—are more popular than ones targeted at other parts of the process. Almost twice as many CASE users have front-end tools than back-end products, which aid in programming, testing and maintenance of applications.

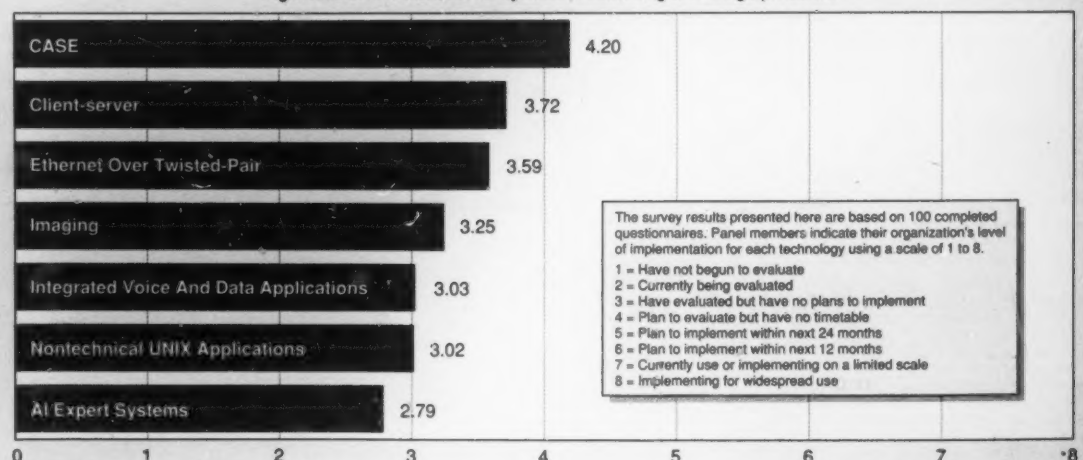
Users Make A Case For CASE


Almost one out of every three user organizations already uses computer-aided software engineering products...
And several more users will make CASE investments in the next 12 months
Don't Know 21%

Source: DATAMATION/Business Research Group

DATAMATION's Technology Implementation Index

CASE leads the pack among new technologies that users intend to implement. Right behind are client/server systems, networking and image products.


CASE 4.20
Client-server 3.72
Ethernet Over Twisted-Pair 3.59
Imaging 3.25
Integrated Voice And Data Applications 3.03
Nontechnical UNIX Applications 3.02
AI Expert Systems 2.79
0 1 2 3 4 5 6 7 8
Have not begun to evaluate
Implementing for widespread use
The survey results presented here are based on 100 completed questionnaires. Panel members indicate their organization's level of implementation for each technology using a scale of 1 to 8.
1 = Have not begun to evaluate
2 = Currently being evaluated
3 = Have evaluated but have no plans to implement
4 = Plan to evaluate but have no timetable
5 = Plan to implement within next 24 months
6 = Plan to implement within next 12 months
7 = Currently use or implementing on a limited scale
8 = Implementing for widespread use

Source: DATAMATION/Business Research Group